1. - 16. (Canceled)

17. (Currently Amended) A device for measuring a property of living tissue, in particular a glucose level of the tissue, said device comprising

an electrode arrangement for application to the tissue,

a signal source for generating an AC voltage at a series of frequencies in a given frequency range to be applied to said electrode arrangement, and

processing circuitry comprising

measuring means for measuring a series of measurement values at the series of frequencies, each measurement value depending on dielectric properties of the tissue at one frequency,

fitting means for fitting a function $M(f, b_0,...,b_K)$ with parameters b_0 to b_K to the measurement values at their given frequencies, or to values derived from the measurement values at their given frequencies, and determining the parameters b_0 to b_K thereby, and

means for using at least part of the parameters b_0 to b_K for determining said property,

~~The device of claim 16,~~ wherein said processing circuitry ~~(37, 38)~~ comprises a measuring circuit [[(37)]] having a first input [[(u1)]] for an input value dependent on said property and on said AC voltage and a second input [[(u2)]] for an input value dependent on said AC voltage but substantially independent of said property, wherein said measurement values $[[(m_i)]]$ are derived from a ratio between said first and said second input value.

18. (Currently Amended) A device for measuring a property of living tissue, in particular a glucose level of the tissue, said device comprising

an electrode arrangement for application to the tissue,

a signal source for generating an AC voltage at a series of frequencies in a given frequency range to be applied to said electrode arrangement, and

processing circuitry comprising

measuring means for measuring a series of measurement values at the series of frequencies, each measurement value depending on dielectric properties of the tissue at one frequency,

fitting means for fitting a function $M(f, b_0,...,b_K)$ with parameters b_0 to b_K to the measurement values at their given frequencies, or to values derived from the measurement values at their given frequencies, and determining the parameters b_0 to b_K thereby, and

means for using at least part of the parameters b_0 to b_K for determining said property,

~~The method of claim 16,~~ wherein said function $M(f, b_0,...,b_K)$ is of the form

$$M(f, b_0,...,b_K) = b_0 + b_1 \cdot f + ... + b_3 \cdot f^R,$$

in particular with $R = 3$.

19. (Currently Amended) A device for measuring a property of living tissue, in particular a glucose level of the tissue, said device comprising

an electrode arrangement for application to the tissue,

a signal source for generating an AC voltage at a series of frequencies in a given frequency range to be applied to said electrode arrangement, and

processing circuitry comprising

measuring means for measuring a series of measurement values at the series of

frequencies, each measurement value depending on dielectric properties of the tissue at one frequency,

fitting means for fitting a function M(f, b_0,...,b_K) with parameters b_0 to b_K to the measurement values at their given frequencies, or to values derived from the measurement values at their given frequencies, and determining the parameters b_0 to b_K thereby, and

means for using at least part of the parameters b_0 to b_K for determining said property,

~~The device of claim 16,~~ wherein said function M(f, b_0,...,b_K) is of the form

$$M(f, b_0, ...b_K) = \sum_{k=0}^{K} b_k \cdot \chi_k(f)$$

and wherein said fitting means is adapted to store a precalculated matrix **A** and/or data derived from said precalculated matrix **A** for fitting a plurality of series of measurement values, wherein matrix $\mathbf{A} = A_{ij}$ is defined by

$$A_{ij} = \chi_j(f_i).$$

20. (Original) The device of claim 19, wherein said fitting means is adapted to store the matrix $(\mathbf{A}^T \cdot \mathbf{A})^{-1} \cdot \mathbf{A}^T$.

21. (Currently Amended) A device for measuring a property of living tissue, in particular a glucose level of the tissue, ~~in particular of claim 1,~~ said device comprising

an electrode arrangement ~~(5, 6)~~ for application to the tissue,

a signal source [[(31)]] for generating an AC voltage ~~(V_{vco})~~ in a given frequency range to be applied to said electrode arrangement ~~(5, 6)~~, and

processing circuitry ~~(37, 38)~~ for measuring a response of the electrode arrangement ~~(5, 6)~~, said response depending on dielectric properties of the tissue, and for converting said

response to said property,

wherein said electrode arrangement comprises

a strip electrode [[(5)]] for being placed against said body,

an outer electrode [[(6)]] for being placed against said body, wherein said outer electrode comprises two lateral sections ~~(6a, 6b)~~ extending substantially parallel to and on opposite sides of said strip electrode [[(5)]], wherein a first [[(6b)]] of said sections is wider than a second [[(6a)]] of said sections.

22. (Currently Amended) The device of claim 21, further comprising an insulating layer [[(5a)]] covering said strip electrode [[(5)]] and at least part of said first section [[(6b)]] of said outer electrode [[(6)]].

23. (Currently Amended) The device of claim 21, wherein said outer electrode [[(6)]] is annular.

24. (Currently Amended) A device for measuring a property of living tissue, in particular a glucose level of the tissue, ~~in particular of claim 1,~~ said device comprising

an electrode arrangement ~~(5, 6)~~ for application to the tissue,

a signal source [[(31)]] for generating an AC voltage ~~(V_{vco})~~ in a given frequency range to be applied to said electrode arrangement ~~(5, 6)~~, and

processing circuitry ~~(37, 38)~~ for measuring a response of the electrode arrangement ~~(5, 6)~~, said response depending on dielectric properties of the tissue, and for converting said response to said property,

wherein said electrode arrangement comprises

at least one electrode ~~(5, 6)~~ placed on an outer side of an electrically insulating substrate [[(4)]],

at least one through-contact ~~(10, 11)~~ extending through said substrate [[(4)]] and connecting said at least one electrode ~~(5, 6)~~,

wherein an outer side of each through-contact is covered by a physiologically inert material.

25. (Original) The device of claim 24, wherein the outer side of each through-contact is covered by a material selected from the group of glass, ceramics, plastics and a noble metals.

26. (Previously Presented) The device of claim 24, wherein said electrode arrangement comprises at least a first electrode for being brought into direct contact with said body and wherein a surface of said first electrode consists of noble metal.

27. (Original) The device of claim 26, wherein the surface of said first electrode consists of gold.

28. (Currently Amended) The device of claim [[1]] 24, wherein said electrode arrangement is part of a resonant circuit, and in particular wherein a resonance frequency of the resonant circuit lies in the given frequency range.

29. (Currently Amended) The device of claim 28, wherein said electrode arrangement forms a capacitor [[(C)]] and is arranged in series to or parallel to an inductance [[(L)]], wherein said capacitor [[(C)]] and said inductance [[(L)]] form said resonant circuit.

30. (Currently Amended) The device of ~~any of~~ claim [[1]] 24, wherein said electrode arrangement ~~(5, 6)~~ is arranged on a flat substrate [[(4)]].

31. (Canceled)

32. (Currently Amended) A method for measuring a property of living tissue, in particular a glucose level of the tissue, said method comprising the steps of

applying an electrode arrangement to the tissue,

generating an AC voltage at a series of frequencies in a given frequency range and applying the AC voltage to said electrode arrangement,

measuring a series of measurement values at the frequencies, each measurement value depending on dielectric properties of the tissue at one frequency,

fitting a function $M(f, b_0,...,b_K)$ with parameters b_0 to b_K to the measurement values at their frequencies, or through values derived from the measurement values at their frequencies, and determining the parameters b_0 to b_K thereby, and

determining said property by using at least part of the parameters b_0 to b_K.

~~The method of claim 31, comprising the steps of~~

measuring a first input value [[(x_1)]] dependent on said property and on said AC voltage,

measuring a second input value [[(x_2)]] dependent on said AC voltage but substantially independent of said property, and

deriving said measurement values [[(m_i)]] from a ratio between said first and said second input value.

33. (Currently Amended) A method for measuring a property of living tissue, in particular a glucose level of the tissue, said method comprising the steps of

applying an electrode arrangement to the tissue,

generating an AC voltage at a series of frequencies in a given frequency range and applying the AC voltage to said electrode arrangement,

measuring a series of measurement values at the frequencies, each measurement value depending on dielectric properties of the tissue at one frequency,

fitting a function $M(f, b_0,...,b_K)$ with parameters b_0 to b_K to the measurement values at their frequencies, or through values derived from the measurement values at their frequencies, and determining the parameters b_0 to b_K thereby, and

determining said property by using at least part of the parameters b_0 to b_K.

~~The method of claim 31,~~ wherein said function $M(f, b_0,...,b_K)$ is of the form

$$M(f, b_0,...,b_K) = b_0 + b_1 \cdot f + ... + b_3 \cdot f^R,$$

in particular with $R = 3$.

34. (Currently Amended) A method for measuring a property of living tissue, in particular a glucose level of the tissue, said method comprising the steps of

applying an electrode arrangement to the tissue,

generating an AC voltage at a series of frequencies in a given frequency range and applying the AC voltage to said electrode arrangement,

measuring a series of measurement values at the frequencies, each measurement value depending on dielectric properties of the tissue at one frequency,

fitting a function $M(f, b_0,...,b_K)$ with parameters b_0 to b_K to the measurement values at their frequencies, or through values derived from the measurement values at their frequencies, and determining the parameters b_0 to b_K thereby, and

determining said property by using at least part of the parameters b_0 to b_K.

~~The method of claim 31,~~ wherein said function $M(f, b_0,...,b_K)$ is of the form

$$M(f, b_0, ...b_K) = \sum_{k=0}^{K} b_k \cdot \chi_k(f)$$

said method further comprising the steps of

storing a precalculated matrix **A** and/or data derived from said precalculated matrix **A**, wherein matrix $\mathbf{A} = A_{ij}$ is defined by $A_{ij} = \chi_j(f_i)$,

using said precalculated matrix **A** and/or said data derived from said precalculated matrix **A** for fitting a plurality of series of measurement values.

35. (Original) The method of claim 34, comprising the step of storing the matrix $(\mathbf{A}^T \cdot \mathbf{A})^{-1} \cdot \mathbf{A}^T$.